

shown at N, Fig. 13. It consists of two flat sheets of asbestos-cement, each approximately $\frac{5}{16}$ -in. thick, attached to an inner corrugated sheet (approx. $\frac{1}{8}$ -in. thick) of similar material. The sheets are jointed in cement mortar and can be painted or distempered as required. This forms a light, durable, fire-resisting and well insulated partition. It is manufactured by the Turner's Asbestos-Cement Co.

This company also produces flat sheets of asbestos-cement which are given a textured finish in five patterns. The sizes are 8 and 4-ft. by 4-ft. by $\frac{1}{4}$ -in. thick. They are butt-jointed and screwed at 12-in. intervals to the studs (16 to 24-in. centres) and noggings (4-ft. centres) of stoothed partitions, or they can be secured to brick, etc., walls to which 2-in. by $\frac{3}{4}$ -in. battens are plugged to receive the screws. The sheets can be painted or distempered.

In addition, this company manufactures *wall board*—8-ft. by 4-ft. by $\frac{1}{4}$ -in. thick—which is mainly composed of asbestos-cement fibre. These boards are secured to studs, noggings, etc., as described above, the screws (with washers) being spaced at 9-in. at the edges and 12-in. at the intermediate supports.

6. GLASS BRICK PARTITIONS.—The details at J, K and L, Fig. 13, were prepared from particulars supplied by the manufacturers, J. A. King & Co. Ltd. The section at J shows a portion of a partition composed of 8-in. by 8-in. by $1\frac{1}{2}$ -in. solid glass bricks which are grooved on all four edges to permit of slender horizontal and vertical reinforced concrete ribs at the joints. All grooved edges are painted with a light-reflecting paint and then treated with a special bitumastic compound applied hot. This insulation is to permit of expansion and contraction between the glass and concrete. The vertical and horizontal face joints are at least $\frac{3}{8}$ -in. thick. Mild steel rods are embedded in the concrete at the joints; the size of this reinforcement varies, but for normal work the horizontal and vertical rods are $\frac{3}{8}$ and $\frac{1}{4}$ -in. diameter respectively, and they are wired at the intersections. The bricks are plain on one face with an attractive "flemish" pattern on the other.

The section at L shows a portion of a partition consisting of glass units or lenses with horizontal and vertical reinforced concrete joints. It is a double-glazed partition, each unit being hollow and having two $\frac{1}{2}$ -in. thick pieces rebated at all edges. These edges are treated as above. The dimensions of the lenses are 8-in. by 8-in. and 6-in. by 6-in. by $1\frac{3}{4}$ -in. when fixed. The joints are only $\frac{1}{8}$ -in. thick.

The above are two examples of "Glascrete" construction. Such semi-transparent partitions are being employed for corridors, staircase wells, etc., in contemporary buildings.

Another form of glass brick is shown at x, Fig. 5, Vol. II.

7. METAL PARTITIONS.—Mild steel and bronze are two of several metals which are used in the manufacture of partitions. These may be designed to consist of a series of panels, secured to posts, walls, etc., or the whole of both surfaces may be flush: some of the panels may be prepared for glazing. The panels vary from $1\frac{1}{2}$ to 2-in. thick and may be of 20-gauge mild steel or $\frac{1}{8}$ to $\frac{1}{4}$ -in. thick bronze: the thickness of the steel for the posts may be increased to

18-gauge. A sectional plan of a steel post and portions of adjacent panels are shown at o, Fig. 13. The panels are sometimes packed with insulating material (see below). Partitions may also be constructed of bronze or nickel alloys extruded over wood panels or cores; this construction is detailed in Vol. IV.

SOUND-PROOFING

Sound insulation, or the prevention of sound transmission from one part of a structure to another, is an important subject and one which presents several difficult and complicated problems. As an introduction to the subject it is only possible in this volume to indicate briefly some of the methods employed to improve the sound insulation of some of the types of construction which are included in a second year syllabus, *i.e.*, partitions and wood floors.

Sound may be air-borne or it may originate by direct contact with the structure. Speech and music are examples of air-borne sound, and the second or impact type includes noises produced when walking, hammering, or banging doors.

As sound is readily transmitted through cracks, partially filled mortar joints, badly fitting doors and windows, etc., it follows that good insulation cannot be obtained unless sound construction is maintained throughout. For the same reason there should be no gaps between the vertical edges of a cross-partition (such as that shown at B, Fig. 14) and the adjacent main walls or partitions. Nor should there be a space between the head and sill of the partition and the floors.

Sound travels considerable distances along solid walls, and is thereby transmitted from one room to another in a building. It follows, therefore, that division walls or partitions should be isolated from adjacent main walls. This can be effected by using continuous pads (see p. 51) at the edges of the partitions. Insulation at the head and sill of a partition also assists in preventing the transmission of sound from one boundary (such as a floor) to another (see pp. 49 and 51).

In general, the transmission of air-borne sound through walls and floors decreases as their weight increases. A thick, well constructed brick or masonry wall is therefore effective in resisting the transmission of sound. However, the modern tendency is to construct relatively thin walls and light internal partitions, and this has led to an increased application of insulating materials which, because of their porous nature, absorb sound and partially reduce the volume transmitted.

A large number of proprietary materials are now obtainable which are claimed to have high sound-absorbing powers. One of the oldest is *slag wool*, a very light fibrous fireproof material produced by the blowing of steam through molten blast-furnace slag. It may be applied to floors and partitions in a loose condition, when it is called *pugging*, or it can be obtained in quilt or blanket form and in slabs. The quilted kind consists of slag wool which is sewn between specially prepared paper; it is obtained in 3-ft. wide rolls, is $\frac{1}{4}$ to 1-in. thick, and is